Recent Searches

Close window | Help

Add terms to your search using: AND

21. PDN (<05/08/2000) and paint and formulator and Internet — 14 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
20. PDN (<05/08/2000) and paint and formulator and database — 9 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
19. PDN (<05/08/2000) and paint and formulator — 279 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
18. PDN (<05/08/2000) and paint and database and raw materials and characteristic — 61 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
17. PDN (<05/08/2000) and paint and database and raw materials and characteristic — 61 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
16. PDN (<05/08/2000) and chemidex — 3 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
15. PDN (<05/08/2000) and paint and database and raw materials — 190 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
14. PDN (<05/08/2000) and paint and database and raw materials — 190 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
13. PDN (<05/08/2000) and paint formulation and database — 9 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text
    Look for terms in: Citation and article text
    Publication type:All publication types
12. PDN (<05/08/2000) and paint formulation and Internet — 5 results — Add to Search
    Database:Multiple databases...
    Limit results to: full text

Look for terms in: Citation and article text
Publication type:All publication types

11. PDN (<05/08/2000) and paint formulation — 166 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

10. PDN (<05/08/2000) and paint formulation — 166 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

9. PDN (<05/08/2000) and custom paint and characteristic and start and modify — 1 result [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

8. PDN (<05/08/2000) and paint and custom and characteristic and start and modify — 78 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

7. PDN (<05/08/2000) and paint and custom and characteristic and start and modify — 78 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

6. PDN (<05/08/2000) and paint and custom and characteristic and start — 563 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

5. PDN (<05/08/2000) and paint and custom and characteristic and starting formula — 0 result [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

4. PDN (<05/08/2000) and paint and custom and characteristic and starting forumla — 0 result [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

3. PDN (<05/08/2000) and paint and custom and characteristic — 1421 results [Add to Search]
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

2. PDN (<05/08/2000) and paint formulation and custom — 6 results [Add to Search]
Database:Multiple databases...
Limit results to: full text

Look for terms in: Citation and article text
Publication type:All publication types

1. PDN (<05/08/2000) and paint formulation 166 results Add to Search
Database:Multiple databases...
Limit results to: full text
Look for terms in: Citation and article text
Publication type:All publication types

Close window | **Help**

Kaolin-based pigment use shifts with customized formulations

Jan Jeffries. **Pulp & Paper**. San Francisco: May 1997. Vol. 71, Iss. 5; pg. 53, 4 pgs

» **Jump to full text**

Subjects:	Paper industry, Pigments, Trends, Innovations, Predictions, Statistical data
Classification Codes	Paper industry, Pigments, Trends, Innovations, Predictions, Statistical data
Classification Codes	9190 US, 8630 Lumber & wood products industries, includes paper, 9140 Statistical dat
Locations:	US
Author(s):	Jan Jeffries
Publication title:	Pulp & Paper. San Francisco: May 1997. Vol. 71, Iss. 5; pg. 53, 4 pgs
Source Type:	Periodical
ISSN/ISBN:	00334081
ProQuest document ID:	11684164
Text Word Count	1862
Article URL:	http://gateway.proquest.com/openurl?ctx_ver=z39.88-2003&res_id=xri:pqd&rft_val_fmt=

Abstract (Article Summary)

Kaolin-based pigments are essential in helping paper meet today's stringent appearance and performance standards and can comprise as much as 100% of a coating's pigment content. Demand for kaolin-based pigments jumped 20% from 1990 to 1995 and now stands at 10.3 mtpy. This growth should continue at a pace of 2%-4% annually through the year 2000. The expanding demand for kaolin-based pigments reflects the paper industry's ongoing quest for more efficient mill operations and better finished sheet performance. As mills have adopted more efficient practices, kaolin-based pigments have become more sophisticated. New advances include the following: 1. processes that select tighter particle size distributions and reduce impurities, 2. products that compensate for the drawbacks of calcium carbonate, and 3. less abrasive calcined kaolin-based pigments that reduce wear of coater blades during coating, slitters during conversion and plates during printing.

Full Text (1862 words)

[Headnote]
Coated paper producers are putting greater demands on kaolin coating pigments to meet sometimes contradictory performance goals

PAPER COATING INGREDIENTS HAVE EVOLVED rapidly in the past decade and continue to do so. This is especially true of kaolin-based pigments, which are essential in helping paper meet today's

stringent appearance and performance standards and can comprise as much as 100% of a coating's pigment content.

Demand for kaolin-based pigments jumped 20% from 1990 to 1995 and now stands at 10.3 mtpy.This growth should continue at a pace of 2/04%/year. through the year 2000, when it should total 12.1 mtpy (Figure 1). Behind the statistics lie industrywide trends and dramatic shifts in the nature of these pigments.

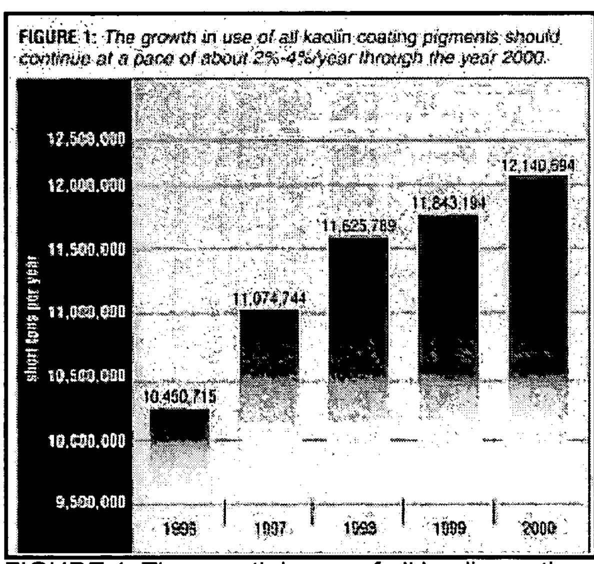
Kaolin-based pigments can be grouped into four broad areas-standard hydrous, delaminated, structured, and engineered composites. Structured products are created by thermal or chemical processes, while engineered forms reflect tight control of particle shape and size. Products in each category are differentiated by such properties as particle size and shape, brightness, and rheology.

Kaolin-based pigments are used in coated groundwood and free-sheet papers, from super-premium high quality to coated No. 5 grades. Standard hydrous kaolin-based products, with a TAPPI brightness of 86 to 88, have seen demand grow at an annual rate of 3% since 1990 to 3.2 mtpy in 1996 (Figure 2).These are used in the No. 3 and No. 4 coated woodfree and No. 4 and No. 5 coated groundwood papers.

About 1.4 million tpy of premium brightness hydrous kaolin-based pigments (having a TAPPI brightness of 90 to more than 91) were sold in 1996 (Figure 3) for use in No. 1 and No. 2 coated woodfree papers. Sales of premium and standard brightness hydrous grades should reach about 1.7 million and 3.7 mtpy by the year 2000, respectively.

Delaminated kaolins grades have experienced the strongest growth in merchant grade papers (highquality, art-type paper) where its use has increased significantly since 1992. Overall, utilization of these grades should grow from about 2.8 mtpy in 1996 to 3.4 mtpy in 2000 (Figure 4). Delaminated products offer excellent coverage and printing properties, and can provide glossy or matte finishes.

Demand for thermally structured (calcined) grades increased 55% in the past five years and now stands at about 414,000 tpy Market growth should bring this to about 470,000 tpy by 2000 (Figure 5).These grades enhance paper optical and printing properties and are often more cost-effective than other pigments as opacifying agents.



Enlarge 200%
Enlarge 400%

FIGURE 1: The growth in use of all kaolin coating pigments should continue at a pace of about 2%-4%/year through the year 2000.

Engineered composites are a relatively new category and find use in coating applications, particularly where good print gloss and optical properties are required. Demand for coating pigments in the chemically structured portion of this category has more than doubled since 1994 and stood at about 152,000 tpy in 1996 (Figure 6). Continued growth for chemically-structured engineered pigments should bring them to about 171,000 tpy in the year 2000.

COATING AND PAPER TRENDS. The expanding demand for kaolin-based pigments reflects the paper industry's ongoing quest for more efficient mill operations and better finished sheet performance. As mills have adopted more efficient practices, kaolin-based pigments have become more sophisticated.

For example, as mills increase machine speeds from 2,000 fpm to more than 5,000 fpm, they boost productivity but challenge the coating **formulator** to cope with higher shear rates at the coater and the increased possibility of defects. In addition, mills want high solids coatings to improve coating quality and reduce energy consumption during drying.This challenges suppliers to devise kaolin-based pigments that flow well at high solids concentrations.

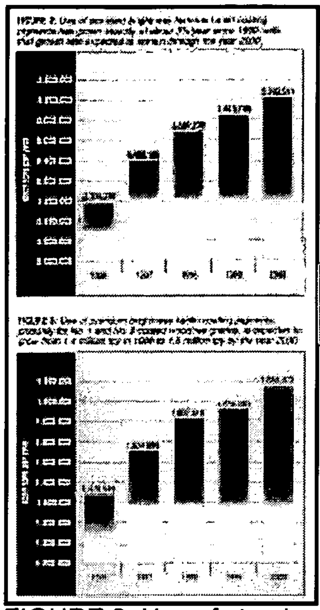
Mills also want to replace high-priced ingredients with value-added ones that reduce coating system cost. In this regard, kaolin-based pigments, which typically fall between $60 and $400/ton, are about onequarter the price of titanium dioxide pigments and about one-fifteenth the price of plastic pigments. Beyond simply extending more expensive components, **formulators** often turn to advanced kaolinbased pigments as they seek to optimize overall coating performance.

On the product side, mills continually try to improve whiteness, brightness, sheet gloss, opacity, and printability (a broad area that encompasses print gloss, snap, smoothness, show through, pick resistance, print mottle, and other factors). Requirements vary with the paper made. For instance, coated woodfree grades need high whiteness and printing performance in regards to ink lay and dot integrity.

In lightweight coated markets, coating weight has decreased as end users seek to lower postage costs through ultra-lightweight grades having basis weights well below 30 lb. Despite the thinner coating, adequate opacity, coverage, smoothness, and other qualities must be retained. As a result, papermakers have emphasized coating brightness, opacity, and ink gloss, which has led to increased use of high-priced additives.To improve their economics, mills have turned to advanced kaolin-based pigments as less costly, but equally effective ways to ensure optical properties.

NEW PIGMENTS EMERGE. In response to these trends, a new, more sophisticated generation of kaolin-based pigments has emerged with optical, rheological, and performance benefits unavailable just five years ago. For instance, new technology now allows for a TAPPI brightness of 96 in calcined kaolin-based pigments and more than 91 in hydrous pigments, significantly higher than brightness levels available in the early 1990s.

Another effect of these trends is a shift in demand from products based on a one-size-fits-all mentality to specialty pigments. This has created a curve that not only peaks in the middle size range, as it traditionally did, but now also has peaks for fine and coarse products. In this context, fine specialty grades are in demand to improve print and sheet gloss, while grades that have the ultrafine particles removed improve opacity and brightness, reduce the need for binder, and improve smoothness and printability.



Enlarge 200%
Enlarge 400%

FIGURE 2: Use of standard brightness hydrous kaolin coating pigments has grown steadily at about 3%/year since 1990, with that growth rate expected to remain through the year 2000.

Beyond this, kaolin-based pigment suppliers have advanced their products in many ways to meet the paper industry's unfolding operating and market needs.These advances include the following:

Processes that select tighter particle size distributions and reduce impurities. A good example is technology that includes a novel beneficiation method to efficiently remove titanium-based impurities from kaolin. This technology, for example, has enabled Engelhard to introduce a hydrous coating pigment with a 91 TAPPI brightness, one point above prior pigments.

Products that compensate for the drawbacks of calcium carbonate, e.g. fine kaolin-based pigments that offset the inherent loss of gloss with calcium carbonate. In addition, new calcium carbonate co-pigments have become available that overcome the yellowing and smoothness problems of many traditional co-pigments.

Grades that enhance coverage to provide good base-sheet hiding at low coat weights, aid smoothness, and enhance printability, especially in rotogravure applications.

Pigments that improve whiteness and brightness, for instance, the recently introduced hydrous pigment with TAPPI brightness of 91 and the 96 TAPPI brightness pigment that advanced brightness in the calcined category a full three points, both of which were mentioned above.

Coating pigments with improved rheology that allow a higher solids content. A new hydrous kaolinbased pigment, for instance, has 74% solids and a rheology that is as good as or better than other commercially available products that have 70-71% solids. In the calcined area, high solids coatings have progressed from about 50% to near 60% while retaining good viscosity.

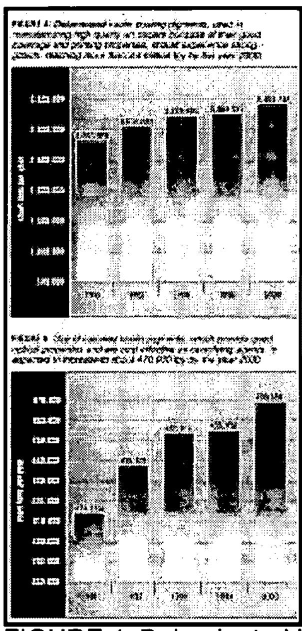
Less abrasive calcined kaolin-based pigments that reduce wear of coater blades during coating, slitters during conversion, and plates during printing.

Customized composite coating pigments that combine the performance of two or more pigment families in a single product (e.g., kaolin-based and titanium dioxide pigments) to meet the opacity, optical, and other needs of individual mills.

Non-traditional chemically structured pigments that provide excellent hiding, opacity, smoothness, and ink receptivity.

FUTURE DEVELOPMENTS. Future kaolin-based pigments must keep up with developing papermaking technology. They will have to adapt to such advances as soft-nip calendering and metering size presses in addition to the ongoing trend toward faster machines and lower energy use. No matter how machines change, however, such paper quality factors as gloss, opacity, print gloss, and brightness must not.

As a result, kaolin-based pigments will grow even more specialized as mills require suppliers to meet specific needs. Some of the future technical and operational challenges facing those who manufacture kaolin-based pigments include the following:



Enlarge 200%
Enlarge 400%

FIGURE 4: Delaminated kaolin coating pigments, used in manufacturing high quality art papers because of their good coverage and printing properties, should experience strong growth, reaching more than 3.4 million tpy by the year 2000.

Kaolin-based pigments will be asked to satisfy contradictory performance requirements more frequently. An example is improving pick resistance in highly structured coatings or balancing runnability at high solids with smoothness, especially in rotogravure papers.

Suppliers and mills will need a deeper understanding of how these pigments interact with the rest of the coating, especially in high-solids systems, to improve overall performance. Suppliers will need an in-depth understanding of binders, additives, surfactants, and other components to take such a holistic approach.

They will also need a better understanding of pigment and dry coating structure to ensure that, as water is driven off or absorbed in advanced high-speed machines, the coating does not move into the sheet. In addition, critical pigment volume, a **paint** industry concept that looks at how pigment particles pack together to fill voids, will become more important.

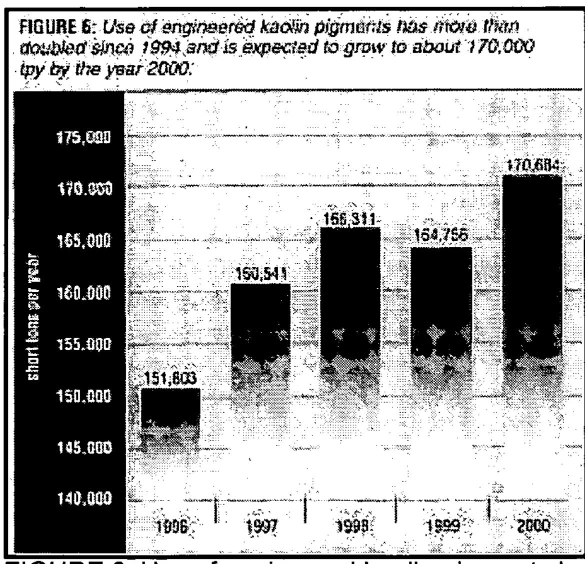
They will need to make better use of mill-supplier teams. These teams will grow in importance, because closer cooperation will be essential in solving future complex coating-related issues.The challenge in

this is that all involved must learn to create the conditions for success-e.g., how to maintain a climate of cooperation and trust while sharing sensitive information.

Beyond these points, supplier knowledge will have to become both broader and deeper. As kaolinbased pigments grow more specialized and customized, suppliers must provide an array of pigments, from standard grades to highly engineered ones.They will need resident skills and abilities to offer mills. And, given the globalization of the paper industry, they will need a worldwide presence.

Kaolin-based pigment suppliers will need a substantial manufacturing base to satisfy demand fluctuations, as well as the financial strength to make ongoing investments in specialty products as mill needs change. They will also need diverse kaolin reserves and flexible manufacturing systems, so they can adopt new methods and still supply a broad range of products.

All of this points to a realignment concerning kaolin-based pigments in the coming decade. As traditional paper coating components, these pigments had come to be perceived as commodity products, but this image is rapidly changing.The reshaping of paper manufacturing by super-fast machines and demanding paper performance standards has fostered a new developments in kaolin-based pigments. A more improved pigment grades are introduced to complement traditional ones, this class of coating pigments will shift toward the specialty pigment category and meet the challenging demands set by the paper industry.



Enlarge 200%
Enlarge 400%

FIGURE 6: Use of engineered kaolin pigments has more than doubled since 1994 and is expected to grow to about 170,000 tpy by the year 2000.

[Author Affiliation]
JAN JEFFRIES is enterprise director, Engelhard Corp., Iselin, NJ.All market-oriented statistics given are extracted from Engelhard's **database**.